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Diseases Insects Pests

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Moldy Feed and Reproductive Failure in Cows

All home-grown feeds contain some fungal spores. When temperature and humidity are suitable, these spores multiply and cause feed to mold or mildew. Rapid growth of molds can cause heating which reduces the energy in a feed that cattle can use. A loss of vitamins A, D_3, E, K and thiamine also results if the feed is heated. Finally, moldy feeds tend to be dusty, which reduces their palatability.

The reproductive performance of cattle may remain unaffected by feeding moldy rations to cattle, but incidences of reduced fertility or high rates of abortion may also occur. The effect that is seen depends on the mechanism of disease involved. This factsheet describes some conditions that may result when cattle eat moldy feeds.

Mycotic abortion

Fungal (mycotic) infections are a common cause of abortion in individual animals. Infection usually occurs after an episode of grain overload or fungal pneumonia. One consequence of these diseases is that particles of fungus enter the blood stream and settle in the pregnant uterus. Abortion can occur any time from the fourth month of pregnancy to full term and is the result of severe placentitis (infection of the afterbirth). If the infection passes through the placenta to the fetus, plagues or crusts of fungus will develop on the skin of the fetus. Diagnosis is made by culturing the organism from aborted tissues. To prevent mycotic abortions, do not abruptly change the diet of pregnant cattle from all forage to one that includes a large amount of grain, and avoid moldy feeds when possible.

Abortion due to Listeria monocytogenes

The bacterium, *Listeria monocytogenes*, is widespread in nature. It is often associated with a dirty environment because it is found in animal, bird and human stool. Moldy forages or silages with a high pH (improperly cured) can harbor *L. monocytogenes* and are a common source of infection for cattle. Infection occurs primarily by eating or inhaling the organism. The infected cow may have a brief fever and depression but abortion will only follow after a stressful event, so a long time may pass before an abortion occurs.

After *L. monocytogenes* enters the body, it travels through the blood stream to the reproductive tract. Once there, it infects the placenta. If large numbers of *L. monocytogenes* bacteria are present, they may invade the fetus and cause it to die. Abortion usually follows within two to three days. Aborted tissues often have a fruity or sweet/sour odour. The diagnosis is made when the bacterium is cultured from fetal or placental tissues. Culturing the organism from silage or spoiled forages is often unsuccessful because it tends to be unevenly distributed within the feed, and the sample that is collected may not be from the right spot.

Abortion due to *L. monocytogenes* is common in Alberta. Treatment with antibiotics is the usual practice after an abortion has occurred. No vaccine is available for prevention. Cattle owners should be aware that *L. monocytogenes* also causes disease in humans. Proper protective clothing should be worn when handling aborted tissues.

Moldy sweet clover

Moldy sweet clover can cause reproductive problems in cattle herds. Sweet clover hay and silage is difficult to make because the succulent nature of the plant encourages mold growth. Poisoning caused by moldy sweet clover is occasionally seen in Alberta.

Poisoning symptoms include abortion or death of a calf shortly after birth, extensive bleeding from the genital tract of the dam, and hemorrhage into the tissues of the calf. A diagnosis is made by gathering several pieces of information. There should be a history of feeding moldy sweet clover, post mortem findings of hemorrhage and detection of coumarin toxins in blood samples taken from the calf.

Copies of this and related publications may be obtained from the Print Media Branch, Alberta Agriculture, 7000 - 113 Street, Edmonton, Alberta T6H 5T6 or Alberta Agriculture's District Offices.

Coumoral is a chemical normally found in sweet clover. However, the action of molds changes it to dicoumarol. This is the same substance that is found in rat poisons. Dicoumarol interferes with blood clotting and results in excessive bleeding.

Vitamin A deficiency

Rations made from actively growing hay or well cured forages generally satisfy the vitamin A requirements of cattle. However, vitamin A levels fall in feeds that are stored for extended periods. In addition, losses of vitamin A are accelerated by feed spoilage.

Reserves of vitamin A are found in the liver of cattle. These reserves usually are not depleted until three to six months after the vitamin A declines in the feed source. This usually coincides with the last third of pregnancy when the requirement for vitamin A is greatest. Vitamin A deficiency may result if moldy or spoiled forages are fed for long periods.

Symptoms of a vitamin A deficiency include reproductive problems in both males and females. Pregnant cows may abort, retain their placenta and develop uterine infection, or give birth to weak, dead or blind calves. Bulls with a vitamin A deficiency produce semen with low numbers of sperm and more abnormalities than expected. Diagnosis is made by analysis of blood samples or a post mortem examination. In Alberta, the occurrence of this problem varies from year to year depending on forage quality.

Allergy

Badly molded feeds often contain large numbers of fungal spores. Cattle that inhale these spores may develop a respiratory allergy or bovine interstitial pneumonia. This disease prevents adequate amounts of oxygen from reaching the blood stream. An infected cow will gasp for breath and the developing fetus may die due to oxygen deprivation. Abortion usually follows in a couple of days. Diagnosis is based on the clinical signs seen in the cow and a history of respiratory distress before abortion. In humans, allergy to fungal spores of feedstuffs is called "Farmer's Lung".

Mycotoxins

Many molds found in feeds are not toxic, but some varieties produce substances that can result in disease when ingested. These substances are called mycotoxins. Fortunately, the conditions necessary for mycotoxin production rarely occur in locally produced feeds. Therefore, reproductive difficulty due to mycotoxins in Alberta is an infrequent problem. Producers should be aware of these diseases because some feeds imported from other provinces and the United States contain mycotoxins.

Aflatoxins

These toxins are produced by fungi belonging to the family of Aspergillus. *Aspergillus* spp. grow well on corn and cereal grains. Because toxicity is primarily a problem in warmer climates, alflatoxicosis is more common in the United States than in Canada. Aflatoxins often cause nervous symptoms in affected animals. The reproductive effects of alfatoxins include abortion, the birth of weak, deformed calves and reduced fertility caused by reduced vitamin A levels.

Estrogenism

Molds of the Fusarium family are known to produce estrogenic substances such as zearalenone. Estrogenism occurs most often after livestock eat field damaged crops such as corn that has been put up during cool wet weather. Ingestion of infected grains can result in development of feminine characteristics in males, premature sexual development of young females, infertility in adults, abortion, stillbirth and the birth of deformed offspring. The effect is most clearly seen in pigs, but clinical signs can also be observed in cattle.

Ochratoxins

These toxins are produced by fungi such as *Aspergillus ochraceus* and *Penicillium viridicatum*. Canadian grain is frequently infested by these organisms. Ochratoxins are associated with kidney and liver damage. Abortions have also been reported.

Ergotism

Ergot toxicity is most frequently seen during wet seasons. *Claviceps purpurea*, the offending fungus, infects the seed heads of rye, triticale, wheat, barley, oats and some grasses. Two forms of disease exist: a) a nervous form that results in convulsions and staggers in sheep and horses and b) a gangrenous form that causes lameness and the loss of extremities in cattle. Abortion is one of the symptoms which follows consumption of infected plants.

Penicillium molds

Penicillium roquefortii is sometimes found on moldy grains and silage. It is associated with abortion, retained placenta and reduced fertility in cattle.

Summary

Abortion and death of newborn calves due to *L. monocytogenes*, fungal invasion of the pregnant uterus

and Vitamin A deficiency are occasionally observed in Alberta cattle herds. Reproductive failure caused by moldy sweet clover poisoning, allergy and mycotoxicosis are less frequent. When moldy feeds are suspected in cases of infertility, abortion, or the death of calves, a complete history and a toxicologic analysis of feed is required to establish a diagnosis.

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